planned channel map (e.g., a ringmap for a ring network) or other information required to provision optical services between selected nodes. EMS 188 ~~180~~ may also include a user interface for a user to monitor the status of the optical network.

Please amend paragraph 21 as follows:

An individual node 120 may also have a craft interface terminal (CIT) 190 coupled to the node. A CIT may be any local computer having a user interface for a technician to monitor the status of the optical node and/or the optical network. A CIT is commonly configured to emulate the user interface of EMS 188 ~~180~~. In particular, a technician may use a CIT to monitor node status or alarm signals in a manner similar to EMS 188 ~~180~~.

Please amend paragraph 29 as follows:

The network configuration determined from the information model may be used in a variety of different ways. In one embodiment, the discovered network configuration is provided to an EMS. This permits an EMS to correct its map of the network. An EMS may, for example, display the discovered network configuration on a user interface. Additionally, an EMS may use the discovered network information to correct its model of the network configuration and to issue appropriate error correction commands. For example, the EMS may use the discovered network configuration to determine if the network configuration can provide a desired quality of service (QOS) and level of protection. If the discovered network configuration is incapable of providing

the desired QOS and protection, the EMS may use the discovered network configuration to determine a correction to the network sufficient to provide the desired QOS and level of protection. For example, in one embodiment of an error correction mode, the EMS determines if one or more nodes may be re-provisioned to provide the desired service and issues appropriate provisioning commands. Alternatively, the EMS may determine a suitable hardware or software adjustment to one or more nodes for the network to provide the desired QOS and level of protection.

Please amend paragraph 32 as follows:

FIG. 2 is a flow chart of one method of forming configuration information for an optical network. The neighbors of each node are discovered 202 by exchanging node identification messages 168 ~~160~~ between the nodes, with each identification message including a source node ID. It is desirable that the exchange of node identification message produces sufficient information to identify fiber misconnection errors. Consequently, in one embodiment, the source node ID has an associated exit span identifier to identify the exit port from which the message originated. At the receiving node an entrance span identifier may be associated with the received identification message to identify the entrance port from which the message was received. This data may be used to identify node-to-node links for neighboring nodes. In one embodiment, each node publishes data describing its neighbors to at least one other portion of the optical network. This may, for example, include data pairs describing the ID of the receiving node and the ID of each sending node (e.g., data identifying pairs of

neighboring nodes). The data may be forwarded from node-to-node across an internode communications channel.

Please amend paragraph 35 as follows:

FIG. 3 is a block diagram showing in more detail the major components of one embodiment of an optical node 120 for practicing the present invention in a WDM network. In this embodiment, optical node 120 typically includes a transport complex 305 and an administrative complex 310. The transport complex 305 includes the optical components for adding, dropping, and passing through optical wavelength channels. The administrative complex 310 provides high-level administrative functions for the node. It includes at least one processor 312 having an associated memory. The administrative complex 310 has an EMS interface 314 for communicating with an EMS or CIT. An inter-node communication module 316 may be implemented using any suitable technique, such as communicating data between nodes on an optical supervisory channel (OSC). The administrative complex 310 receives provisioning data 318 from the EMS 188 ~~180~~. The provisioning data 318 includes the planned optical network configuration (e.g., information corresponding to a map of the planned network topology and other configuration information)).

Please amend paragraph 40 as follows:

Referring to Table I, an information model 380 ~~280~~ may be formed to describe the relationship of the neighboring pairs of nodes. The information model preferably has a data format that facilitates determining a topological map having the same neighbor

relationships. As one example, for a ring network the information may have a data structure from which a ring map may be calculated. For the example *of* FIG. 4A, the East span of node 1 is coupled to the West span of node 2; the East span of Node 2 is coupled to the West span of Node 3; the East span of Node 3 is coupled to the West span of Node 4; and the East span of Node 4 is coupled to the West span of Node 1. Additionally, the information model may also summarize the node configuration data of each node, such as the node type.

Node Pairs	Node Type
lE-2W	Node 1 =TI
2E-3W	Node 2=T2
3E-4W	Node 3=TI
4E-IW	Node 4=TI

Please amend paragraph 45 as follows:

In one embodiment, configuration discovery module 320 is implemented as managed objects of the administrative complex software using a suitable software language, such as the C^{++} language. The C^{++} language includes classes, where a class in C^{++} is defined as a collection of data and the procedures that operate on the data. FIG. 5 is a block diagram of one embodiment of a configuration discovery module implemented as a plurality of software modules residing on a processor 312 implemented using computer classes and threads compatible with an operating system running on a

microprocessor. A Provisioning Information object, TcMo, 505 is used to receive the provisioning information of the administrative complex and provide it to the Protocol Manager 515 ~~510~~. Protocol manager 515 includes a finite state machine to coordinate the actions of the other modules. A Signal Application 520 discovers the immediately connected neighbors and supplies this information to the Protocol Manager 515. In one embodiment, Signal Application 520 (SigApp) is a signal infrastructure module that extracts the node configuration data in received message packets. It is used to send message packets with configuration information to other network elements. As one example, the Signal Infrastructure Module 520 may use an OSC communication module to communicate with other nodes. Fault Correlation and Alarms Manager 525 is an object that supports generating an alarm signal to alert a user to configuration errors. It publishes an alarm event that may be processed to display an error message to a user (e.g., via an EMS or CIT).

Please amend paragraph 46 as follows:

FIG. 6 is a Rose model diagram 600 illustrating in more detail some of the software relationships that can be used to implement the functions described for the configuration discovery application 500 of FIG. 5. The TopThread 605 is a class that represents the thread that the Protocol Manager runs in. In one embodiment it inherits from an application thread class a generic thread model. The TopManInterface class 610 implements a state machine and configuration discovery algorithm. This class receives

and stores the provisioned information. It also handles messages sent by other network elements and constructs an information model of the network. In one embodiment the class continues a discovery phase until a stopping condition is satisfied, after which it compares the discovered configuration to the provisioned configuration and determines whether a configuration error exists. If a configuration error exists, it generates an alarm signal. A PublisherInterfaceObject 630 is used to publish configuration information. A TopManProxy 615 is a proxy interface to permit entities in the administrative complex and the transport complex to communicate with the Protocol Manager. TopInfo 620 is a class that represents a model of the span that is used to send messages from the node and includes methods to send and receive a configuration message packet on the optical network. TopSigSpan 625 is a class that represent mode of the span that is used to send messages from the node. The configuration protocols call methods that are implemented in this class to send and receive ~~received~~ protocol packets on the optical network. SigApp 675 implements the methods that are required for the discovery of nodes that are immediately connected to the spans of the node. SigApp 675 provides this information to the Protocol manager by making use of the proxy class.

IN THE CLAIMS

The current status of all claims is provided below.

1. (Presently Amended) A method to determine configuration information associated with an optical network having a plurality of optical nodes coupled by optical fiber spans, the method comprising:

discovering at least one neighboring optical node, each neighboring optical